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Rail Road News.

Whitney's Railroad to the Pacific.

It is now generally known that Asa Whitney, of New York, has petitioned Congress for a grant of lands commencing at Lake Michigan, of 60 miles wide, and extending to the Pacific, or 92,160,000, (the State of New York contains only 28,440,000 acres, including lakes and rivers) to be applied to the building of a railroad to the Pacific. We published his scheme in Volume 2, and cannot go over the features again, and we only refer to it now as being a scheme which has met the approbation of a Committee appointed by Congress, who have made a favorable report on the subject, strongly recommending Congress to pass a Bill embracing the conditions set forth in Mr. Whitney's petition, viz., that he should construct the road by the sale of the said lands. The proposals are fair, and the results to be anticipated from the construction of this road, incalculable. Mr. Whitney says it will make our country the half-way house between the East Indies and China, and Europe. Mr. Whitney has devoted a great number of years to this, his gigantic scheme, and with untiring energy he is still as determined as ever to carry out his project. He must have expended a fortune upon it already.

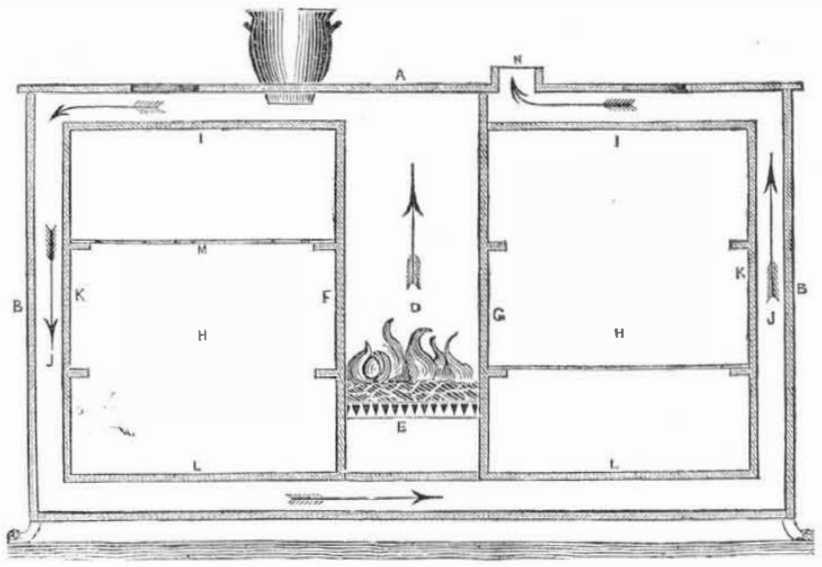
The Committee, we see, endeavor to create a little excitement in favor of immediate action by our Government, by suggesting the probability of England constructing such a road through Canada. Whenever any new scheme is brought forth there is certainly a great amount of weakness displayed in holding up John Bull to whip us into the traces, either out of spite, fear, or what not. Uncle John has got his hands full of railroads at home. He never will build a railroad through Canada—it would be absurdity to do so. He is more sagacious than that: his eye and hand are now on a shorter route to his East India possessions, viz., through Egypt: he has already commenced operations there. This scheme, we believe, is practicable, and Mr. Whitney deserves a great amount of praise, and more than this—he deserves fame and success.

First Railroad Charter in America.

The first Charter for a Railroad in this country was granted by New Jersey. The Legislature, at the session of 1814–15, chartered the New Jersey Railroad Company, to build a road four rods wide from the river Delaware, near Trenton, to the river Raritan, near New Brunswick. The country was not then prepared for the enterprise, and the work was abandoned. The honor of introducing railroads was reserved for Massachusetts, and the first road that was built on this continent, was the Quincy Railroad, from the quarry to Neponset river, which was first used in the year 1827.

A locomotive exploded on the Western Rail Road, at Clappville, Mass., on last Saturday.

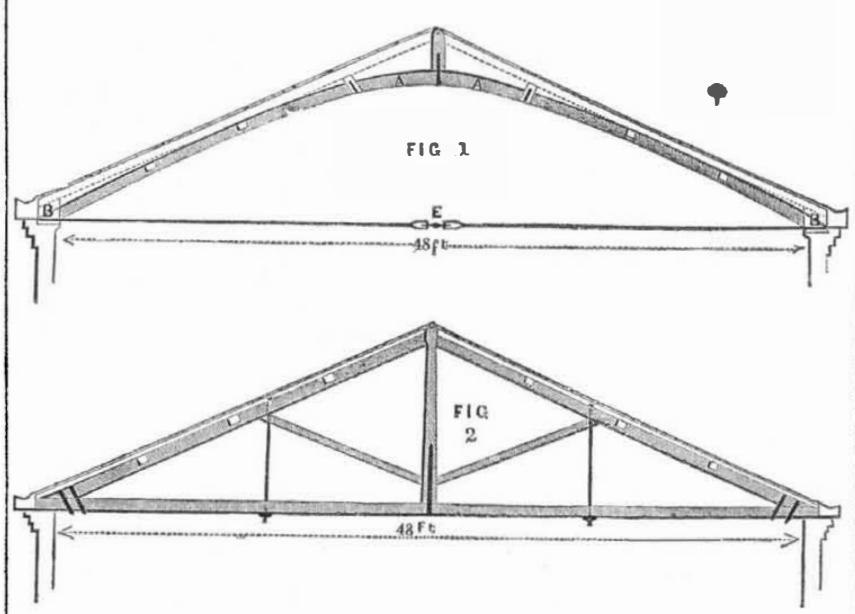
JACKSON'S PATENT COOKING STOVE.



This cooking stove is the invention of Mr. Henry Jackson, of Evansville, Vanderburg Co., Indiana, and patented on the 23d day of April last. It is a double cooking stove, and is so arranged in its various parts that a far higher degree of heat can be maintained in one compartment than another; for cooking delicate dishes in one part, and roasting in another, as may be desired. This figure is a vertical section, exhibiting the stove in operation. A is the top plate; B B are the side plates; D is the fire chamber; E is the grate; F G are the division plates running back and dividing the stove into two compartments, H H. The plate G is continued up to and unites with the top plate. The plate F terminates short of the top plate, A, and unites with an inside plate, I, at the top, forming the first out flue, as shown by the arrow, the said flues, J J, being formed around by the outside plates and the inside plates, K K, L L, and the other top plate, I, and the smoke passes out at the pipe, N. The fire being made in the chamber, E, the flame and heated smoke and air pass off through the flue, K, first around the left side compartment, I, surrounding it with a highly charged current of caloric, which raises the heat in this compartment to a degree much greater than in the other, around which the current of caloric passes when comparatively exhausted—an effect which is obvious. The top of the stove over the left side compartment, under which the flame and heated air directly pass, will be exposed also to a powerful heat, and it is accordingly provided with openings or places to set pots or kettles for boiling, &c., while the top on the other side will be subjected to only a moderate heat, which for many culniary purposes, will be found very convenient. Thus it will be seen that boiling, roasting, or other kind of cooking, which need a powerful heat, may be conducted on one side, and in one part, while delicate dishes, &c., requiring a moderate heat, are prepared in the other.

Communications addressed, post-paid, to Mr. Jackson, will receive prompt attention. The claim is for "a Double Cooking Stove, with two compartments, the smoke flue passing first around one and then around the other."

BEVAN'S PATENT ARCH GIRDER.



In our last number we described Bevan's Patent Arch Girder, as designed for bridges, and stated our conviction that its strength, &c. would recommend it to general use; we have since examined into the cost of construction, and believe that a bridge 100 feet in length, between supports, with a roadway of 12 feet, can be erected in a substantial manner for $500. We would ask our readers whether there is at present known any other plan of bridge to compete with this in economy; for strength we say, only examine the principles of construction, and conviction must follow. We are most warm in our praise of this invention from a thorough conviction that it is one of great practical utility—one that must return both honor and profit to the inventor. We shall watch its progress and from time to time publish engravings of any works which may possess general interest. We would further advise its application to swing, draws and landing stages; we throw this out as a hint to Mr. Bevan.

In our present number we publish engravings of two roofs. Fig. 1 is a roof constructed on the Arch Girder. Fig. 2 is the roof of he Car House at the Depot of the Hudson River Railroad, Tenth Avenue, N. Y. This roof is selected merely for the purpose of contrasting the weight of a roof, admittedly well framed and of ample strength, with the weight of a roof of like span constructed on the principles of the patent.

In fig. 1, A is a girder formed of two beams bolted together with blocks between, as in the Girder for bridges—the beams being formed of layers of plates, the inner layer breaking joints with the outer layer; a flexible strapping of iron wire rope or strap iron, is passed over the upper face of the arch and brought round the ends to the clamps, and right and left screw, E. The strapping is drawn to any required tightness by the screw, and the arch girder is lifted into its berth, its ends resting in bolsters, B B, fixed on the side walls. The ridge board is supported by a short king post; the rafter beams truss the arch girder and keep it from buckling. The ends of the girder may have friction pulleys fastened to them as in the bridge girder. The strength of this roof is evidently within itself, and as we remarked in our last number, the girder cannot fail unless the strapping is first broken; now this is almost impossible, it having been ascertained that a wire rope 1 inch in diameter is able to support 30 tons. The extreme lightness, independent of its cheapness, will recommend it generally to railroad companies, &c. We shall, in conclusion, give the relative weight and cost of materials in figures 1 and 2:—Fig. 1, timber in girder, A, 270 feet, of 1 inch thickness, weighing 778 lbs; cost $5,50. Flexible strapping, weight 112 lbs., cost $9,98; iron bolts, 50 lbs., cost $3. Total weight, 940 lbs; total cost of materials, $18.38. Fig. 2.—Timber, 804 feet of 1 inch, weighing 2,245 lbs.; cost, $16,08; iron in bolts, cramps, &c., 203 lbs.; cost, $12,18. Total weight, 2,448 lbs. Total cost, $28,26.

For further particulars, or to inspect models, apply to Freeman Campbell, Esq., 608 Washington, street, and 7 Broad street, N. Y. The well known reputation of this gentleman, and his high standing in our city, need no comment from us.

New Coloring Matter.

M. Garot obtains, by acting upon the root of the rhubarb by nitric acid, a substance which he calls "erythrose." It combines with the alkalies, forming coloring compounds susceptible of application in the arts. The compounds with potash and with ammonia possess, according to M. Garot, a coloring power many times greater than that of cochineal.

[The above we extract from an exchange, and have some doubts about its correctness as a whole. That its nature is different from cochineal, there can be no doubt, as the latter is an animal substance, and does not give out its coloring matter with alkalies. It may, however, be a good substitute for madder, as *it* gives out *its* coloring matter in the same way.

The steamship Viceroy, bound from this port to Halifax, and thence to Ireland, has been wrecked between Cape Sable and the Seal Island. There is some fatality about all Irish enterprises.

It is reported that Table Rock, at Niagara Falls, has fallen. We do not believe the report.

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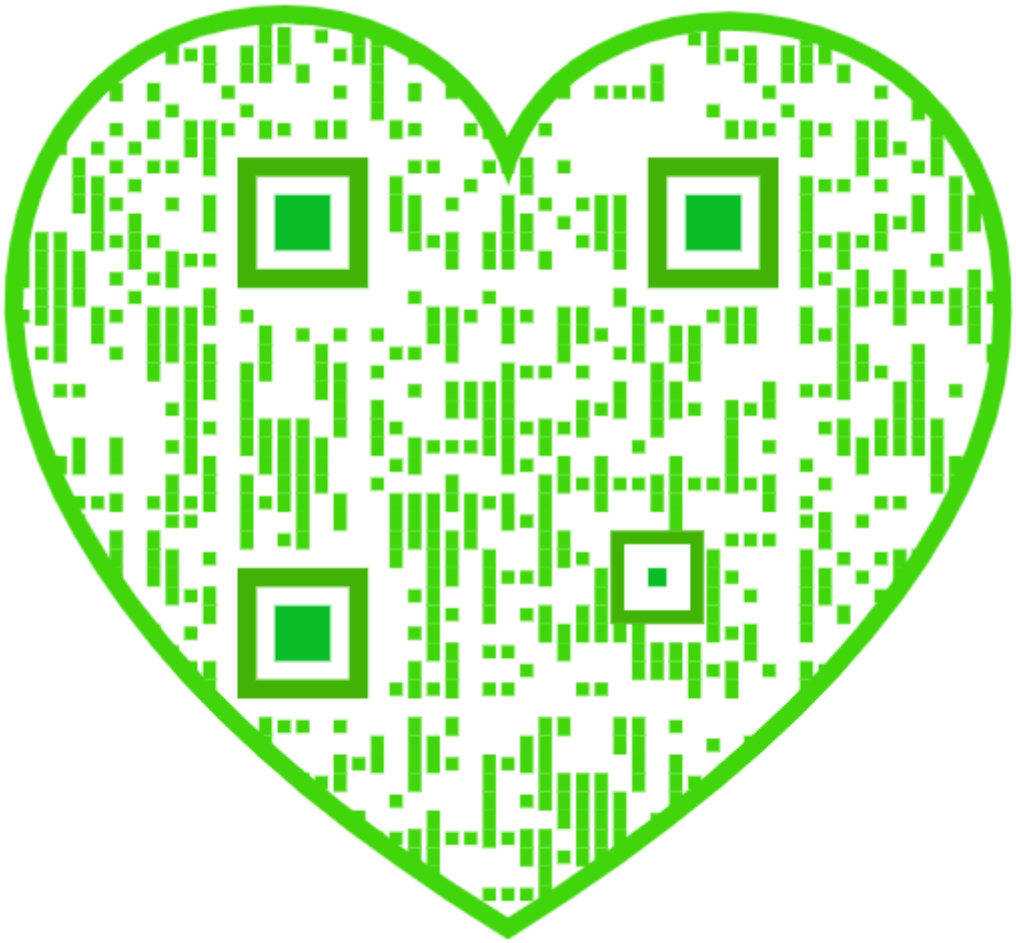

Miscellaneous.

The Cocoanut of Jamaica.

Mr. Bigelow writing from Jamaica, to the New York Post, thus describes the manner in which the indolent people of that beautiful Island neglect the blessings of a beneficent Providence :

"To illustrate this supineness a little more in detail, there is the cocoanut, one of the most profitable fruits thatthe earth produces, is turned to no account whatever by the Jamaicans, though it grows luxuiantly here as in any quarter of the globe. I was told, by a gentleman who had a large number of these trees growing, that he would esteem it the best property on his estate, if he could get one dollar a hundred for the nuts, but that there was a very limited market for them at any price.—And yet there is no part of this fruit that is not valuable. It thrives in a sandy soil, and bears in Jamaica within three or four years after it is planted. From its flowers the finest arrack in the world may be distilled, and the best of vinegar. A coarse brown sugar may also be prepared from the flower. The green fruit yields a nutritious and delightful drink, and a more substantial food in the pulp which contains the liquid. When ripe, the fruit is popular as an article of diet in all parts of the world. From that fruit a pure oil may he extracted, which may be manufactured into candles, soap, and used in a variety of other ways, in whieh vegetable oils are available, while the refuse, or oil cake, as it is called, is a most excellent food for cattle.

A medicinal oil is extracted from the bark, which is used, I understand, in Ceylon as an efficacions remedy in cutaneous diseases; the root is also used for medicinal purposes; its elastic fibres are sometimes woven into strainers for liquids, while the timber may be used in building, or converted into beautiful articles of furniture. The husk consists of tough fibre, from which cordage and rigging of the best quality may be manufactured, and which furnishes the finest stuffing for mattresses that is used, not excepting hair. I saw some of this fibre manufactured at the prison in Kingston, for mattress stuffing. I satisfied myself that if its value was known in America it would bring a higher price than any commodity now in use for bedding. The specimens that I saw were manufactured by the convicts, at a cost, I was told, of six cents a pound. Hair costs with us, I believe, about twenty-five cents.—The process of manufacturing it is very simple,—the husk shells are soaked till perfectly soft, and then are pounded out until the fibres are all separated. This was done in the prison by hand, and without the use of machinery, and yet the article could be produced by them for six cents a pound. By the aid of a very simple machine, something, for instance, like that to which rags in a paper mill are first subjected, it is very apparent that the cost of manufacturing it might be reduced at least one-half. When I asked why machinery was not employed in this department of the prison, I was told that they had not work enough to occupy the convicts if machinery was employed. Of course I had nothing to say to a reason so conclusive as that.

The supply of these husks would be almost inexhaustible. They have no more use or value here than walnut shells have with us, and may be had by the ship load for the mere expense of cartage. A cargo of a thousand tons could be manufactured for a thousand dollars, and be worth in the port of New York not less than $4,000, as soon as the usefulness of the article became generally known."

Death of a Great Inventor.

Mr. Smith, of Deanston, Scotland, a gentleman well known in America for his improvements on machinery for spinning cotton, died suddenly in his bed on the 9th of June last. Mr. Smith was agent in Scotland for the Matteawan Co., N. Y. He was a man of great scientific acquirements and practical skill. He was eminent for his knowledge of machinery and agriculture. He was frank, sociable, kind and unaffected in his manners—one of nature's noblemen.

Causes of Rain.

Heat and water are the fruitful parents of winds and clouds. When aqueous vapor is precipitated in rain or snow, heat that was latent becomes again sensible, and by increasing the capacity of the air to hold water in the form of vapor, prevents a disastrous deluge of this abundant element in nature. The laws which restrain the precipitation of water from the clouds are no less curious than those which cause it to rain at all. The atmosphere must approach saturation before it can rain, and it usually happens that the quantities which will fall on a given area, one hundred feet above the ground, and on the earth, are unequal. Large drops, in falling through many feet of dry air, become smaller by constant evaporation, and may be wholly dissipated before they reach the earth. On the other hand, quite small drops formed in cold regions, high in the air, constantly condense more vapor in falling through a saturated atmosphere, and will be many times latger when they reach the ground than at their starting point.

To illustrate the production of rain, let us suppose that a current of air at 70° temperature, saturated with moisture, meets and mingles with another current, also saturated, but having a heat of 50°. Now, if the atmosphere at the mean temperature of 60° had a capacity to hold water as an invisible vapor, equal to the mean of 70° and 50°, it is obvious that no precipation would take place. But such is not the fact. The quantity of water held in air heated from 60° to 70° cannot be contained in that heated from 50° to 60°. In other words, whatever cools air saturated with moisture, causes a cloud, dew, mist, or rain.

[The above is a short extract from the Agricultural Report of the Patent Office, presented to Commissioner Ewbank by Dr. Lee, who was appointed for this purpose. The Report is not yet officially published, but we hope it soon will for it is one of the most able and valuable reports we have ever read and will be of immense benefit to our farmers.

Turkish Manners.

We naturally regard the Turks as a species of outside barbarians, and it is a little difficult to survey them with a perfectly unprejudiced eye; yet, an honest view affords much that can be contemplated with satisfaction. Their gravity of mein, their soberness of gait, and rich flowing robes, give them an air of gentlemanly dignity, in pleasing contrast with their hurried expression, the impertinent carriage, and the stiff, angular garments of Franks; and their is a natural ease and delicacy in their social forms and etiquette that is far superior to anything ordinary observed at home. Personal cleanliness is not among them as among us, a half-neglected "semi-virtue," but a scrupulously-fulfilled religious obligation. Propriety and courtesy distinguish their mutual intercourse, and hospitality, rendered to all without distinction of country or condition, is an inviolable duty. Quarrelling is extremely rare among them, and their treatment of the brute creation is far kinder than ours. The Koran prescribes the giving of one-tenth of their incomes to charitable purposes, and benevolence with them is no transient impulse, but an abiding sacred principle.

Telegraph and Newspaper Dinner.

A complimentary dinner was given on Tuesday evening of last week, at the Astor House, to M. Lefferts, Esq., by the members of the New York Associated Press, and a splendid present was made to Mr. Lefferts, consisting of a salver, two pitchers, coffee urn, and a rich silver sett, valued at $800. The Associated Press consists of the Courier and Enquirer, Journal of Commerce, Express, Herald, Sun and Tribune. A number of speeches were made by the gentlemen of the press. Mr. H. O'Reilly was there, and so was Bain, the inventor of the Telegraph used on that line.—They were complimented highly, the former for his energy in establishing Telegraphic lines and the latter for his invention.

G. S. Davenport of Pen Yann, N. Y., is authorized to receive subscriptions to the Scientific American.

City Improvements.

The business community of this city seem possessed with a remarkable spirit of "go-aheadativeness," unsurpassed perhaps by any other in the world. Combined with this they are evidently "as proud as Lucifer," and what would seem a luxury in days of yore, is now only to be swept away among the things that were. The present seems to be an interesting era in the history of New York, so far as concerns its external appearance. The enterprise of our citizens is illustrated in a remarkable degree by the splendid character of the buildings now in progress,—no doubt but this season has been more prolific in this respect, than any other since the first stone was laid towards the completion of this gigantic superstructure, on all sides new or substantial stone or brick building are made to supplant those which might seem, in every respect, ample for the business interests. Such, however, seems not to be the view taken by our merchants—instead of a store sixty or seventy-five feet deep, they must have one from a hundred to two hundred, fitted up in the most elaborate and beautiful style, outvieing in design the halls of the ancients devoted to the display of artistic skill. This fact alone may be taken as a criterion of the successful state of business generally. We like to look upon these substantial monuments of enterprise. They display the improving taste of our mechanics, while they afford them a field for employment as well as improvement. Commencing at Reade street, we notice that Mr. Stewart, the princely merchant, is nearly doubling the size of his marble palace, which at present is the largest establishment of the kind in the world. On the block between Ann and Fulton, the renowned Barnum and the celebrated hatter Genin, have presented to the curious a scene which attracts unusual attention. We notice in this block that the Graefenberg Company have fitted up a magnificent office, devoted to the sale of their celebrated medicines. The interior is beautifully painted in fresco by one of our first artists, while the front presents a most unique and chaste appearance, richly ornamented with the business signs of the Company. The principal entablature is supported by two Carytides, one representing Esculapius, the God of Medicine; the other representing Mercury, the God of Commerce. The main entrance is richly ornamented by the finest carved work, symbolical of strength and wisdom, combining some of the finest specimens of artistic skill that we have ever seen. This is but a hint of what is going on in the way of improvement, and there can be no doubt but that New York will be a great place when it is done.

The Route to California Through Nicaragua.

This road, it is said, will be in operation some two months hence. The steamships Crescent City and Empire City are to run between New York and San Juan and the lake of Nicaragua will be navigated by steamboats of light draught to the town of Nicaragua, distant fourteen miles from the Pacific, which distance will be traversed on land be means of carriages. By the time that these arrangements are completed, the steamships New Orleans and Sarah Sands will connect with the Cresent City and Empire City on the Pacific, and regularly on that ocean to San Francisco—thus making the line of communication complete between New York and California by that route. Four additional steamboats are intended to be placed on the Pacific side. This route, from the Atlantic seaboard to the Pacific and California will be about one thousand miles shorter than that by the Isthmus of Panama.

Great Speed on the Utica and Schenectady Railroad.

The locomotive "Erastus Corning," built at the Company's shop in Schenectady, made the passage from Utica to Schenectady, with a full passenger train, on Wednesay afternoon, last week, in one hour and forty-three minutes running time! The distance is seventy-eight miles. The train left Utica at 4 o'clock, 35 minutes, P. M., and arrived at Schenectady at 6 o'clock, 50 minutes, P. M., making eight stoppages, which occupied 32 minutes.—[Albany Argus.

A Dangerous Rock.

Commander V. M. Randolph, of the United States ship "Albany.," reports, on the authority of Sir Robert Schomberg, H. B. M. Consul-General of the republic of Dominica, the posi- of a dangerous rock, not correctly known to the charts, on the south side of the island of San Domingo.

This rock is in latitude 17 deg. 37 min. 40 sec., west of Greenwich.

The English merchant-vessel, "the Leighton," struck upon it last year; the Spanish frigate, "Isabella Segunda," is said to have lost her rudder upon it a few months ago.

The bearing of this "Leighton's rock" is given as north 35 deg. 30 min. west from Alta Vela, distance 93 miles, and from Isle de Vache south 28 deg. 6 min. east, distance 29 miles.

Accidents by Lightning.

There is not a year passes without a great number of accidents by lightning, such as houses being struck or individuals killed. In the great majority of those persons who have been struck with lightning they were standing near the chimney, an open window, at the door, or under a tree. This should teach people to be more careful of the places they occupy during a thunder storm. In country places every house should have a lightning rod, and to spread abroad some useful information upon this subject, we commence a series of articles on our last page, this week, which wil l be completed in two or three weeks.

Oxygen Gas a Cure for Cholera.

Dr. Macrea, in the hospital at Howrah, has, according to the Indian news, discovered a new and most successful mode of treating cholera patients. He causes them to inhale a certain quantity of oxygen gas, which contributes a strong stimulating effect, and finally throws the patient into a refreshing sleep. On awakening, he finds himself restored to health, with the exception of a general weakness which always succeeds any physical prostration. Dr. Macrae had tested his mode of practice upon 15 European seamen, who have been carried to the Howrah Hospital in the last stage of the disease, and the patient has in every instance recovered.

The following named gentlemen were chosen officers of the Mechanics Institute, at the annual election held on Monday evening, June 25th :—

President—Zadock Pratt, Tanner.

First Vice President.—Thos. Smull, Tanner.

Second Vice President.—Horace Greeley, Printer.

Corresponding Secretary.—John B. Whitman, Clerk.

Recording Secretary.—Charles N. Black, Lawyer.

Treasurer.—Wm. T. Leitch, Tailor.

Daguerreotype, Electrotype, Calotype, Galvanizing, &c.—We have just laid upon our table a copy of the second edition of this work, by S. D. Humphrey, Daguerreotype Artist, whose establishment is at No. 177 Broadway. It is a neat little work, but there is an old and a trite saying "good gear can always be rolled in small bulk." It contains a history of the daguerreotype art, describes the whole process, instruments and improvements, and gives particular directions to amateurs and artists. It gives receipts for the preparation of the talbotype paper, calotype and Becquerel's process for producing daguerreotypes with the colors of nature. This book contains all the directions necessary for the photographist, and he who would fully understand how the human face divine can be painted with a sun beam, should read and study this book.

Death of an Eminent Sculptor.

Richard J. Wyatt, the eminent English sculptor, died at Rome on the 29th of May. His hearse was followed to the Protestant burying ground by the British Consul, and Mr. Cass, our Charge d'Affaires. Wyatt approached near to Canova in his female figures.

Sixty engine drivers, lately in the employment of the North British Railway, are about to emigrate to the United States. It will be a long time before they will all find situations in the United States.

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Parker's Water Wheel.

Messrs. Editors,—I have read J. S.'s "Useful Information about Water Wheels," in No. 17 of the present volume, also S. L. in No. 20, and R. C. M. in No. 27, all on the subject of water wheels. The reader will perceive that the first and last writers give a very different account of the useful effect of the same kind of water wheels. L. S. shows that a fixed quantity of water, to grind a bushel of grain, will constantly vary on account of the difference in the head or fall of water, and he might have stated, with the different kind of water wheels; and even the same kind of wheels using the same quantity of water, will vary from 100 to 3 or 400 per cent., owing to the difference in grain, size, and dress of the mill stones. It is seldom you can find two millers or millwrights to agree as to how mill stones ought to be furrowed or dressed. I have satisfied myself from practical experience, that owing to the different ways in furrowing and dressing the millstones, that the same mill, with the same quantity of water on the wheel, will vary, in grinding, from five to twenty bushels an hour. How erroneous, then, will all conclusions be, if we judge of the quality or useful effect of the different kind of water wheels, from a simple statement of the number of bushels ground in a given time, while we are ignorant of other circumstances that ought to be brought into the calculation. What is here said about grinding will, with equal force, apply to many other purposes—such as sawing lumber, owing to the difference of timber and fixtures about the mill.

The best way I know of testing the useful effect that the different kind of water wheel will yield, from the absolute power applied, or water used, is to apply the friction brake, similar to that used by M. D. Prony to the turbine wheel of Fourneyron. This is a very simple, correct and useful instrument, and uniform in its answers.

Would it not, Messrs. Editors, add much to the interest of the country, to have the Commissioner of Patents, or some suitable person or persons appointed by him, or Congress, take what is considered our best kind of water wheel. and test them by actual experience, with the friction brake, or any other mode that would be more satisfactory, and show to the world the useful effect or per centage of power they yield, from the absolute power they use? Statements coming from such a respectable and disinterested source, might be relied on by all, and the beneficial results would be almost innumerable. It does seem that a little of the public money spent in this way, would benefit our country more than the way much of it is now spent.

Your correspondent, R. C. M., says, "according to the laws of hydraulics, a percussion wheel is one that moves with the water, and a re-action wheel moves in a contrary direction. If a percussion (or re-action, I suppose) wheel moves faster than the water that propels it, where, and from what source, does it derive its power? According to well known principles, action and re-action are opposite and are equal. If so, how can they be combined on the same wheel, with one current of water, upon the same surface, at the same time, to produce any effect?" R. C. M. seems to doubt J. S.'s assertion that a wheel ran seven per cent. faster than the water that propelled it. Such a statement does seem like an impossibility. But it appears J. S. is not alone in his assertion, and is not the first that made such a discovery. Mr. Waring, in the third volume of the American Phil. Society's transactions, describes a machine, (on the principle of a re-action or Barker wheel) on De la Cour's construction, from his own inspection, where the fall was twenty-one feet, and the radius of the arms, from the centre point to the centre of the discharging orifice, forty-six inches,—that the wheel, when unloaded, made 115 turns in a minute, giving a velocity of 9 5-8 feet in a second, faster than the water would flow out under a 21 feet head of pressure,—which excess of velocity he attributes to the prodigious centrefugal force generated in the arms, upon which principle the wheel in a great measure depends for its useful effect. Statements coming from such a respectable source, ought not to be treated with contempt, because they don't happen to agree with our present theory. Facts are stubborn things, and when experience and theory will not agree, the theory must be wrong.

I will now try and show R. C. M. how a re-action and action, although in different directions, may be combined with the same current of water, at the same time, with a double wheel properly constructed. But whether any power will be gained by the application, I am at present unable to decide. But as I am now busy making such a wheel, as I shall now describe, and intend testing it by actual observation and experience, perhaps I may give you the result of the trial in some future communication after I have fairly tested it. I shall try its effect with the friction brake, and with all the impartiality I can bring to bear on the subject.

Let a water wheel be constructed on the principle of Whitelaw and Sterrat's re-action, (the water applied from below the wheel, as they apply it) with any number of vents, say six or eight, (and the American Turbine, illustrated in No. 3 of your present volume, with only two vents, seems to work on the same principle ;) this wheel would answer the same purpose as the fixed disc in the turbine of Fourneyron—and suppose this wheel or disc instead of being stationary, as in the turbine of Fourneyron, that it be fixed to a revolving shaft, and of course it would revolve on the principle of re-action. Then let another wheel or rim be constructed like the turbine of Fourneyron, that will fit over it, the inside diameter of the outer wheel to fit the outside diameter of the re-action or disc wheel, making due allowance for clearance; let this turbine be keyed on to a hollow shaft that will fit and turn on the shaft of the disc or re-action wheel. Both shafts will be vertical, and it is evident the wheels and shafts will revolve in different directions, for the water, as it escapes from the inside wheel, will impinge on the buckets of the turbine, and will re-act on the inside, and act on the outside wheel. Let the shaft of the re-action wheel be a foot or two longer than the hollow shaft of the turbine that fits it, and let both shafts of each water wheel have a band-wheel or pulley keyed on to them, communicating with a band wheel on a separate shaft, and one of the belts of the turbine or re-action running crossed, it is evident they will operate in the same direction, and each wheel will exert the power it is capable of yielding, although running opposite, in turning the separate shaft in one direction. The power can now be taken from this shaft and applied as other mill work. I hope R. C. M. will now perceive that the same current of water, at the same time, can be made to re-act, and act on a double wheel properly constructed. I am not aware of water ever having been so applied, and made some inquiries of you, Messrs. Editors, in a former letter to ascertain if you knew of its application. I will now try the experiment to see if any power will be gained by the application of water on this principle. Any kind of a water wheel that will yield from 70 to 90 per cent. useful effect, from the absolute power applied, is a good wheel. And that kind of water wheel that is the most uniform and easily regulated in its motions, the simplest, cheapest, most durable, not liable to get out of order, not effected by back water, and will yield the most useful effect, from the amount of water used is the best. But ask scientific and practical mechanics what form of water wheel combines and yields those results, and the answers will almost be as different as the form of the water wheels. This shows that there is much to learn and to be decided by practical observation and experience, even on water wheels—although the application of them are as old as Adam and Eve.

G. B.

Little Rock, Ark., 1850.

Sugar in France.

The quantity of sugar manufactured in France is greatly on the increase. Beet root is the material. There are 288 manufactories and the number of pounds produced up to this time, this year, is almost double what it was for the corresponding season last year.

The Benefits of Coffee as an Article of food.

At a recent meeting of the Academy of Science, Paris, a communication from M. de Gasparin, a very scientific argriculturist, excited a great deal of interest. This gentleman had heard of a body of miners in the neighborhood of Chaleroi, on the Belgian frontier, who subsisted altogether on a peculiar diet essentially vegetable, and enjoyed with it excellent health, and great muscular strength. He visited the spot; and found the regime of these prime workmen, universally to be this: on rising, the miner drank half a quart of liquid coffee and chicory, mixed in equal quantity, with about a tenth part of milk; he ate, too, a stout slice of bread and butter. He carried with him to the mine some slices of bread and butter, and a tin quart bottle filled with the same coffee, as food during the day; on his return home in the evening, he made a supper of dressed potatoes and cabbage, or other green vegetables, and finished with a cup of his coffee and a slice of bread and butter. It was only on Sundays and festival days, that he ate even a small quantity of meat and drank about two quarts of beer; no fermented liquors on week-days.

Azote being the great doctrinal principal of nourishment, Mr. Gasparin calculated closely, and ascertained that the daily fare of the robust Charleroi miner did not contain half the quantity which might be supposed requisite for health and strength. There was less nutrition than in the diet or regime of the most austere religious orders, or in that of the inmates of the French central prisons. French miners had tried in vain to equal the men of Charleroi, though they fed themselves much more substantially. All the population that subsisted in the way above described, were in comparatively easy circumstances. A man with a wife and six children kept free of debt, and lived with some comfort on two francs—forty cents—a day.

The savan concluded that it must be the coffee which worked the miracle in the human frame. He knew that this berry had been eminently serviceable to the French troops in Algeria, in their arduous and fatigueing expeditions; and to the crews of exploring vessels in the artic regions. All the nations that use it considerably are of sober habits. It accounts for the prodigious abstinence of the Arabian caravans. Hence, not being nutritive, it must possess other properties, does it assist or consummate digestion? or does it retard the mutation of the organs which then require a less consumption of renovating material? M. de Gasparin would not decide, but he was sure that the subject was of much consequence.—To be able to subsist so cheaply with such bodily advantage, would prove a signal gain for the laboring classes, particularly in seasons of scarcity.

M. Majendie, threw out immediately, some sensible comments on this communication.—"It was true, he said, in general, that the alimentary substances that contain little or no azote, are not nutritious; he had, himself, established this fact many years ago; but it must not be inferred from any of the experiments made on this point of physiology, that the proportion of azote contained in an aliment expressed strictly its nutrive power. A num- of very highly azoted substances were not nutritious. Majendie specified various instances. The disproportion of azote in substances equally alimentary is sometimes enormous even in the same substance of equal weight, differently modified.

"Let me suggest," he added, "that all that relates to the theory of nutrition is yet covered with an impenetrable veil. We know almost nothing on this important and fundamental phenomenon. We begin to understand the different acts or processes of digestion,—thanks to the recent labors of physologists, and particularly of M. Bernard, but all that happens in the formation and absorption of the chyle, all that passes in the blood and the intimity of the organic tissues and of the fluids, is still enveloped in utter obscurity. Thus you see, that we are far from being authorized to infer the nutrive qualtities of an article of food from the proportion of azote which enters among its chemical elements."

Another academician indicated as important considerations overlooked by M. de Gasparin, the race or species of men in question, the mean duration of their lives, the special influence of localities, &c.

He might, methinks. have ascribed some share of virtue to the chicory. This ingredient is employed in vast quantity in France.—It struck me with some surprise that so much of it is consumed in Great Britain in the same away. The annual consumption of coffee proper is, there, thirty-seven millions of pounds; of chicory, as mixture, twenty-two millions; four pence per pound duty is levied on colonial coffee. The best associate for coffee known to me, is burnt acorns or chesnuts, ground—what the French call glands doux d'Espagne, of which a great quantity is manufactured in the South of France. It has proved effectual in cholera, and often cures chronic diarrhœa. It best counteracts the operation of coffee on the nerves.

Handling Molten Lead and Iron.

The Boston Traveller says experiments, similar to those recently made in France, by which molten lead and iron are handled with entire impunity, the hands and arms being boldly immersed in the boiling liquids, have been tried with equal success at the scientific school, Cambridge. A fortuitous circumstance discovered that the apparently wonderful results were nothing but the simple effect of what is called the spheroidal forms, which prevent the immediate contact of the iron with the skin. The experiments are to be repeated before the Natural History Society of Boston soon. If so, they will be duly reported.

[It is very singular to see how long some things take to get into some of our daily papers, after they have been published in the Scientific American. It is a long time since we first noticed the experiments made by Boutigny in France. It is now 4 or 5 years since they were given to the world. In a paper lately submitted to the Academy of science by M. Corne, he says:

"Having determined on investigation the question whether the employment of liquid sulphurous acid for moistening the hands would produce a sensation of coldness when they are immersed in the melted metal. I immersed my hands, previously moistened with sulphuric acid, in the melted lead, and experienced a sensation of decided cold.

I repeated the experiment of immersing the hand in melted lead and infused cast iron.—Before experimenting with the melted iron, I placed a stick previously moistened with water, in the stream of liquid metal, and on withdrawing it found it to be almost as wet as before; scarcely any of the moisture was evaporated. The moment a dry piece of wood was placed in contact with the heated metal, combustion took place. M. Covlet and I then dipped our hands into vessels of the liquid metal, and passed our fingers several times backwards and forwards through a stream of metal flowing from the furnace and the heat from the radiation of the fused metal being at the same time almost unbearable."

There is one thing about this which is very remarkable, viz., the sensation of cold when the hand is moistened with sulphuric acid and dipped into the metal. If the hand is quite dry and dipped into sulphuric acid, no pain will be felt for some time, but if the hand be wet with cold water and dipped into the acid, it will commence to burn in a moment.

The Mechanical Labor on a Newspaper.

Few persons have any idea of the vast amount of mechanical labor, independent of the mental exertion, which is required in the production of a newspaper. The London Times with its mammoth supplement has 72 closely printed columns, which contain 17,500 lines, made up of more than a million pieces of type. Thirty-four thousand copies of this paper and supplement have been printed in about four hours. The greatest number ever printed in one day was 54,000, and the paper used weighed seven tons, the usual weight being four and a half tons. The surface printed every night (with a single supplement) is thirty acres, the weight of type in constant use is seven tons, and 110 compositors and 25 pressmen are constantly employed.

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New Inventions.

Report of the Scientific Committee to Investigate Paine's Light.

We give below the Report of the Committee employed by the Gas Companies of this City to examine into the merits of Mr. Paine's alledged discovery, as mentioned by us last week :—

WORCESTER, Mass., Tuesday, June 25.

We, the undersigned, met at the Worcester Hotel this day by appointment—Mr. Green, the agent of Mr. Pedrick, having given to Mr. Roome the assurance that Mr. Paine would this day be present and prove to his satisfaction and the satisfaction of such scientific gentleman as he (Mr. Roome) might invite, that his discovery of a new method of decomposing water and generating illuminating gas was genuine and valuable.

Having been introduced to Mr. Pedrick, the partner of Mr. Paine, by Mr. Green, the latter stated that he was sorry Mr. Paine could not be present, having been called from the city by a previous engagement. Mr. Pedrick invited us to visit the machinery of Mr. Paine, at his room in the Worcester Exchange building. We accordingly proceeded to do so and were there introduced to a younger brother of Mr. Paine.

In the centre of the room we saw a disjointed piece of machinery, said by Mr. Pedrick to be the machine with which Mr. Paine decomposed water. Mr. Pedrick and Mr. Paine, Jr. explained as far, they said, as they could do so, the action of this machine, but from its disjointed and imperfect state we could form no definite idea of its mode of operation.

Thence we accompained Messrs. Pedrick and Green to the dwelling of Mr. Paine, the brother of Mr. Paine having preceded us. On arriving at the house we were ushered into a front parlor. A two light gas bracket stood on the mantel. Mr. Paine, Jr. lighted one of the burners, which gave a very bright light. On smelling the gas, as it passed through these burners when not lighted, it had the odor of oil resin gas. We were then shown into a basement room in the rear of the house. In this room, supported on four bricks, was a box about two feet square and ten inches high, said by Mr. Paine, Jr. to contain the magnets —two strips of copper, said to be the electrodes, extended from the box to a circular tin vessel which Mr. Paine, Jr., called the decomposing vessel. From this vessel a pipe passed through the wall, and we were told connected with a gas holder placed on the outside of the building.—From this pipe was a branch leading to a small tin cylinder of the capacity of a quart measure.

In this cylinder Mr. Paine, Jr. said the gas used in the house was carbonized. A small plugged opening attached to this cylinder leaked. Dr. Torrey tasted the liquid which dropped, and ascertained it to be water. Another branch pipe leading from the one connecting the gas holder with the decomposing vessel, turned off in another direction and bending downward, passed through the cork of a wide-necked bottle and dipped into spirits of turpentine—this bottle was of glass. Another tube was inserted in the cork, with a burner attached to its upper end. Mr. Paine having lighted the gas, it burned with a bright light, proving it to be carburetted hydrogen.

Mr. Paine and Mr. Pedrick both assured us the gas was hydrogen, produced from water by the machine before us, and that it was carbonized by being passed through the turpentine alone.

Mr. Roome then asked Mr. Paine, Jr. to disconnect the pipe from the bottle of turpentine and prove the gas to be free hydrogen by burning it. This Mr. Paine refused to do, saying that his brother had forbiden his disconnecting any pipe.

Mr. Blake then asked Mr. Pedrick if he would permit the pipe that dipped into the spirits of turpentine, to be drawn through the cork far enough to raise it above the surface of the turpentine.

After some conversation between Mr. Pedrick and young Mr. Paine, during which the *latter left the room and returned*, Mr. Pedrick consented, and the pipe was raised as requested; on applying a match, the gas burned with a very feeble light, showing the presence of free hydrogen. Mr. Roome then asked that the pipe be again immersed in the turpentine and the burner lighted as before. Mr. Paine, Jr. objected, but as we all insisted upon the experiment being made, it was done, and the flame from the gas after passing through turpentine, was proved beyond all doubt in our minds to be hydrogen only, and not carburetted hydrogen as at first, and to be totally unfit for illumination. Mr. Paine, Jr. on witnessing the result of the last experiment, appeared confused and declared that the light burned as well as before, but Drs. Torrey and Chilton told him that the light did not burn as well as before, but was much paler, to which we all assented. Mr. Paine then shut off the gas and positively refused to permit further examination.

(Signed)—JOHN TORREY, M. D. Prof. Chemistry in College of Physicians and Surgeons New York.

JAMES R. CHILTON, M. D. Practical Chemist, New York.

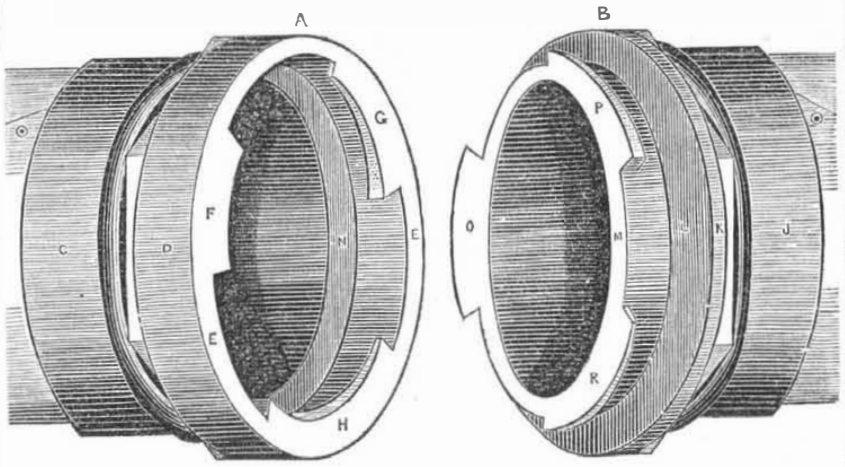
CHARLES ROOME, Engineer Manhattan Gas Works, New York.

GEORGE DARRACOTT, Agent, Boston Gas Co.

J. H. BLAKE, Engineer and Chemist, Boston.

[Next week we shall review this subject and show that Mr. Paine has used some prevarication in his communications to the Scientific American, which were published long before this hulla-baloo on the subject; and we shall show that the scientific objections presented in our columns to his alledged discovery, are corroborated by his own testimonials.—[ED.

BROWN'S COUPLING FOR HOSE OR PIPE.



This engraving represents a coupling for pipes, invented by Mr. A. Heyer Brown, of the city of Albany, N. Y., and for which he has recently received letters patent of the United States. This figure is a perspective view of the coupling when separated, and each part turned toward the separator.

The coupling, A, consists of a hollow metal ferule, C, attached to the hose by the method now in use. This ferule is enlarged at its other end, to form a cylindrical shaped box, D, the edge, E, of which is of sufficient thickness to form a firm bearing against the flat corresponding part of the coupling, B. On the inside of this box, and next to the edge, E, are placed three equal flanges, F G H, forming the outer portions of a sector formed by the inner circle of the box, D, each flange being a little less than one sixth of the circumference of the said circle, and projecting inwards a distance about equal to the thickness of the box, towards the centre of the circle. The outer edges of these flanges correspond with the edge of the box, their inner sides being slightly oblique, forming small portions of threads of a screw.

The coupling, B, is a hollow metal ferule, J, attached to the hose, and is of equal bore to the ferule, C. Its extremity is enlarged to form the flange, K, equal in diameter to the coupling, A. The edge of the face of this flange at L, towards the coupling, A, is turned at right angles to its axis, so as to bear truly against its edge, E, when the couplings are united. Projecting from the face of this flange is a ring of such a diameter as to pass between the inner edges of the flanges, F G H, of the coupling, A. The bore of this ring is at least equal to that of the ferules, C and J, is just as deep as the box, D, and its end, M, is turned true with the surface, L, so that whenever the ring is inserted into the box the surface, L, will bear truly against the parts, E M and N, thus making a water and steam tight joint. When used for water pipes or hose, the usual packings are put upon L and M, against which the opposing metal surface are tightly pressed. O P R, are three equal flanges placed on the periphery of the ring along its outer edge. They are of such width and form as to pass freely through the intervals between the flanges, F G and H, when the two parts of the coupling are brought together. The inner edges of these flanges are oblique, forming portions of a screw, the reverse of the opposite coupling—the one to couple into and with the other operation. If the flanges, O P R, be passed between the intervals, F G H, and turned to the right hand. B will move freely round until the surfaces of the flanges (being oblique at the same angle) will rest on each other. When this is done, a further slight turn to the right will, by the action of the oblique surfaces on each other, (like the threads of a screw,) press A and B more firmly together, setting the surfaces of L, G, M, and N, against each other, and making a water or steam-tight joint.

The hexagonal rims behind D and K are designed for the application of wrenches, when necessary to connect the couplings firmly, or to disconnect the same.

A specimen of the above described hose-coupling has been left for a few days at this office for examination. Applications for rights or for further information relative to the above invention, will meet with immediate attention, if addressed, post-paid, to the inventor, at Albany, N. Y.

A New Wonder.

The True Democrat says that a Mr. Thayer has invented a process of tanning a sheepskin in three hours, if necessary; ordinarily in twelve! and leaving it to all appearance, as strong and well finished as the softest leather! Those who have tried them, say that skins thus tanned will last as long as the best.

[The above we select, hoping that some more light may dawn upon us from afar on the subject.

A London tailor has produced a novel summer coat, weighing only six ounces, and which can be rolled up to fit a small telescope case, and carried in the pocket.

Improvement in Making Bricks.

We have been informed that bricks are now being made in some places of such a form as to dove-tail into one another. We have not seen any of them, but we can conceive of a brick with a tennon on one end and a mortice on the other.

Philips' Fire Annihilator.

A fair trial of this patented English invention, about which so much has been said by some of our papers, recently came off near London, by a house—a real house—on fire. The Annihilator was annihilated, although managed by the patentee's own workmen.

Glass Water Pipes.

We are glad to know that glass tubes are now coming into a very general use for conveying water. Mr. Wm. T. De Golyer, of Schenectady, N. Y., has a patent for making tubes of such a form as to couple different lengths together, and form glass conductors for water, of any length. About 1000 rods of glass pipes of different diameters have already been laid down, and Mr. John Matthews, of First Avenue, this city, has tested the strength of a pipe 1¼ inch in diameter, made at the Albany Glass Works, (Mr. Mayer, 139 Front st., N. Y., is Agent,) and found it capable of standing a pressure of 200 lbs. to the square inch, or a column of water 450 feet high. Mr. Wilson, of Hastings, a few miles out of the city, has connected these glass tubes with a hydraulic ram to stand a pressure of 80 feet high. After the joints were cemented only four days the water was let on, and the joints were found perfectly tight. It is well known that glass is anti-corrosive, and resists all action of the elements of air and every kind of water: it is therefore indestructible, and when kept from the action of frost, it may be considered as enduring as the everlasting hills. By them water is conveyed in all its purity from the fountain, as the interior is too smooth to allow any weeds or vegetable formations to adhere to it. We do not know the price for laying down different sizes of pipe, (although they are very cheap), but Mr. De Golyer or Mr. Mayer will no doubt promptly furnish all necessary information on the subject, if letters are addressed to them, post-paid.

Ink that Resists the Action of Acids and Alkalies.

Shell Lac, 2 oz.; borax 1 oz., distilled or rain water 18 oz.: boil the whole in a closely covered tin vessel, stirring it occasionally with a glass rod or a small stick, until the mixture has become homogeneous; filter, when cold, through a single sheet of blotting paper; mix the filtered solution, which will be about nineteen fluid ounces, with one ounce of mucilage of gum arabic, prepared by dissolving 1 oz. of water, and add pulverized indigo and lamp-black, ad libitum. Boil the whole again in a covered vessel, and stir the fluid well to effect the complete solution and admixture of the gum arabic; stir it occasionally while it is cooling; and after it has remained undisturbed for two or three hours, that the excess of indigo and lamp-black may subside, bottle it for use. The above ink, for documentary purposes, is invaluable, being, under all ordinary circumstances, indestructible: it is also particularly well adapted for the use of the laboratory. Five drops of kreosote added to a pint of ordinary ink will effectually prevent its becoming mouldy.

Ink for Lithographers.

White soap 25 parts, white wax 25 parts, mutton suet 6 parts, lamp black 6 parts, shell lac 10 parts, mastic 10 parts; mix with heat and proceed as for lithographic ink.

Transfer Paper.

A useful transfer paper may be made for copying monumental inscriptions, brasses, &c., by rubbing a mixture of black-lead and soap over silver paper.

Disinfecting Compound.

A scientific writer in the "Journal de Pharmacie," recommends pulverized plaster of paris, well dried and mixed with rather more than one-fifth its weight of powdered charcoal, as a cheap and most effective mixture for removing the noxious effects of decomposing organic matter. This compound combines with the ammoniacal products which would otherwise escape, and forms a most valuable manure.

[This forms, when dried, a valuable poudrette, for corn especially. For dry situations we believe the chloride of lime to be preferable to any other salt applied to land, as it is a great absorbent of moisture.

New Old Planing Machine.

Next week we will publish cuts of a planing machine with pressure rollers and revolving cylinder, and a tongueing and grooving machine with S cutters, and pressure rollers, which was in operation one mile out of Baltimore, in 1822.

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Chemical Philosophy.

To all matter we ascribe certain properties: water possesses properties of chemical action, and what are known as *physical laws.* It presents the three great conditions of matter on earth, viz., the solid, liquid and gaseous conditions. The first attribute we ascribe to matter is gravity; by this law all bodies have a tendency to approach their common centres of attraction. This force belongs to the laws of Mechanics,—but the force which changes the condition of matter, such as water into steam, or by pouring sulphuric acid on marble and disengaging carbonic gas, is termed "a chemical force." When we look into the constitution of certain bodies, we find them to be made up of particles, some of these being all of one kind, others made up of different kinds. By the voltaic battery, water can be separated into a gas, and that gas again separated into two different gases, one very light and highly combustible, and the other heavier, which will not burn of itself but will assist other bodies to burn, and is called oxygen. The elements of water are oxygen and hydrogen—both gases and both have a gravitating power. Oxygen is the most abundant of all elements: it has neither color, taste nor smell. It has the property of combining with all the other elements in many proportions. By mixing the chlorate of potash with one fifth of its weight of the peroxide of manganese, and applying a gentle heat, the oxygen will be set free, as by the voltaic trough. One hundred cubic inches of this gas weighs 34·6094 grains.

Hydrogen may be separated from water in many ways: if a piece of zinc is placed in a vessel containing water and sulphuric acid, hydrogen gas will be evolved. Hydrogen, unlike oxygen, will burn; 100 cubic inches of it weighs 2·1318 grains. Since there is in water only the molecules which compose the two gases, they are certainly curiously modified to be so heavy under one condition and so light in another. A drop of pearly dew that might gently hang upon a lady's needle, when it becomes gaseous, will fill a large bottle. The power by which the molecules of hydrogen and oxygen combine, to produce water, is termed chemical affinity. This power is totally unlike gravity, yet it cannot exist apart from it. When two bodies having chemical affinity for one another come in contact, each parts with some of its properties, producing a new mass with different properties from those which each possessed separately. Soap is made of oil and potash, each separately possessing different, properties. Common salt is made of soda and chlorine—an acid and an alkali, each possessing quite different properties. If a leaf of silver is placed in a bottle of chlorine gas, for about two weeks, a distinct body will be formed. Chemical affinity is characterized by *waiting* and *instant* attraction.

Oxygen and hydrogen have a great affinity for one another, yet these two elements of water may remain in contact for months and never join to produce water. Affinity in this case waits as a sentinel to receive its orders for operation from some third substance,—such a substance is platinum. When this metal is brought into contact with these two gases, the whole are thrown into action, and water is the result. The two gases, nitrogen and oxygen, which compose our atmosphere, remain in a state of mechanical, not chemical, mixture. On the other hand, when a thin slip of copper is mixed with chlorine gas, the former is at once burned and the chlorine disappears—the action, like the law of gravity, is instant.

Gravity, having commenced action, continues it until its completion, but it is different with chemical affinity, for after it has begun it often becomes suspended after a certain effect is produced. When a piece of bright copper is exposed to the atmosphere for some time it becomes tarnished by an oxide forming on its surface, and there it remains unchanged, waiting for a third substance, such as sulphuric acid to complete the operation. Such are some of the principles of chemical philosophy as it relates to chemical affinity; in other words, that power which enables different elements of matter to combine together—the one forming a mixture, the other a chemical compound, and to produce a chemical compound in all cases, the particles of the two bodies must be different.

Light and Heat from Water.

The following is a specification published in our excellent exchange, the London Patent Journal (8th June), the best periodical of the kind in England, and for which we are agents for the United States. We publish this specification owing to the present excitement respecting Mr. Paine's alledged discovery. As it is of considerable length, we reserve some comments we intended to make upon it, until next week.

Joseph Pierre Gillard, a gentleman, in the Republic of France, for certain improvements in the production of heat and light in general. Patent dated November 22, 1849—enrolled May 22, 1850.

The patentee's invention consists in certain apparatus and processes for producing hydrogen gas, by the decomposition of water, and its application to heat and light. The means and processes by which he obtains this gas are: I. By the incandescency of iron. II. By carbon. III. By magnets.

First—The means and purposes for obtaining hydrogen in decomposing water by incalescent ore. In retorts purposely constructed, and fitted up with iron tubes (enclosed in iron plates) or with iron chains, iron wire, or spirals of the same metal rendered incalescent, the patentee introduces steam from any generator whatever,—or he even produces steam by means of water injected into the retort. The oxygen of the water combines with the iron, and the hydrogen is conducted first into a refrigerant, and thence into a gasometer, from which it is supplied for use.

When the iron is oxidized, the pantentee dis-oxidizes it first by means of the waste gas of furnaces; the carbonic acid of them is at first changed into oxide of carbon within the furnace in which the hydrogen, as well as the oxide of carbon is produced; the last gas is obtained by the passage of steam into the oxide furnace (a kind of kiln); the oxide of carbon and hydrogen are afterwards injected into the retorts containing the oxidized iron; this latter transmits the oxygen to the oxide of carbon, and to the hydrogen which has been generated in the furnace for oxide of carbon.

Secondly—The patentee dis-oxidzes iron by causing to fall on incalescent iron, some pulverized coal, coke, charcoal, pit-coal, ligneous substances, &c.; also by igniting with oxide of iron some hydrogen, oxide of carbon, or by throwing on the incalescent iron some oil or of any the hydrocarburets,—even tar or ammoniacal waters.

Thirdly—The patentee dis-oxidizes iron by submitting it to a white heat, when this metal loses its oxygen like peroxide of manganese, and returns to the state of protoxide of iron, by which means the water is decomposed.

Process for producing hydrogen gas by the decomposition of water with incalescent coal, coke, pit-coal, ligneous substances, or carbonized pit (peat,) or by means of oxide of carbon.—The patentee causes steam to pass into horizontal retorts similar to those employed in gas works, filled up more or less with deep layers of coal; the steam is distributed to the whole of the retorts, and over the surface of the coals, by means of one or more pipes in connection with a boiler, pierced with holes of a small diameter, like the spout of a water-pot; the contact of the steam produces hydrogen, carbonic acid, and a small quantity of oxide of carbon and other gases; these mixed gases pass off through the educt pipe into an epurator, when the carbonic acid is taken up, and the hydrogen passes off into the gasometer. The patentee observes that this apparatus for decomposing water is similar to that in which coal is distilled, differing, however, from it, as regards the steam tubes, the boiler, and the system of depositing the steam on the surface of the coals, instead of passing it through them; these points the patentee states to be new. The patentee also decomposes water by means of magnets, working with induct bobbins; the movements of each magnet on an axis, sets in motion all the bobbins, and as there is only one resistance of attractive action which is resisted by that of the opposite pole, it follows (states the patentee) that in communicating such force, I put in action a considerable number of magnets, by means of cogs, and transmission of mechanical movements, the magnets decompose the water;—pure hydrogen may be collected at one pole, and pure oxygen at the other, and stored in separate gasometers for use.

The patentee's improved process for rendering hydrogen gas illuminating, is by causing a small jet of lighted hydrogen to pass through a burner (the holes very small) on a thin strip of plantinum wire, the threads being excessively fine, and of graduated section, proportioned to intensity of the pressure of the fiame and the burning hydrogen,—a very powerful light is thus produced. The platinum threads are immediately heated to such whiteness that the luminous refulgence is extraordinarily brilliant. Besides platinum, other unalterable and unoxidizible metals may be employed.—The wick must be of the shape necessary to agree with that of the jet of hydrogen,—it may be that of a cone, or any other figure, according to the size which the gas takes when it is allowed egress from the burner; the wick must be made more or less strong, according to the greater or less intensity of the heat to which it is exposed. The burner and wick may be modified in their shape,—the patentee does not limit himself as regards the strength, the length, or the height of the wick, provided the principle of his invention be retained.

Process for heating melting furnaces for ores, locomotive boilers, and dis-oxidizing iron and other metals:—In melting furnaces already constructed, the patentee utlizes the gas which is lost through the mouths (of the furnaces,) and he accelerates the melting of the ore by the combustion of hydrogen, oxide of carbon, and air combined together; the hydrogen is produced either in the retorts, as before stated, or in a furnace, from twelve to fifteen feet high, constructed like a kiln, and filled up with coke, charcoal, pit-coal, or other ligneous substances; the patentee causes a powerful draft to be maintained, at the same time that he injects steam; the hydrogen and oxide of carbon which are produced together, are drawn out by means of a strong mechanical draft.—The melted ore in the furnace is more or less carburetted by the powdered coal thrown upon it, and this process is employed in puddling furnaces, in which carburation is easily effected by cementation, as well for pig iron as for steel. The same hereinbefore described process is equally applicable to reverberatory furnaces, for heating boilers and locomotives. The patentee heats boilers and locomotives by hydrogen and oxide of carbon injected under the boilers in the locomotives with hot or cold air, by means of many small holes or divided and concentric tubes set under the boilers, and he also injects hydrogen and oxide of carbon into the tubes of tubular boilers, by employing concentric tubes, in which the air and gases of the tenders, which are purposely constructed as reservoirs,—are made to enter. The patentee constructs gas burners with double currents of air, that is to say, the air acting internally and externally on the flame; these burners have the advantage of presenting a large quantity of air or of oxygen to the combustion of the gas. The patentee does not confine himself to the precise details in the construction of the apparatus or the precise mode of carrying out the processes described, provided the general features of the mechanical arrangements and processes for carrying out his invention be preserved; but what he claims as his invention is—

First—The production of hydrogen gas by the decomposition of water in furnaces and retorts, serving to distil coal, as hereinbefore described.

Secondly—The process for producing hydrogen and a small quantity of oxide of carbon (carbonic oxide,) hereinbefore described.

Thirdly—The illuminating by means of the electricity of magnets put in motion by any mechanical processes, as hereinbefore described.

Fourthly—The process for producing hydrogen and oxygen, by means of magnets, put in motion simultaneously, by any force whatever, the two gases being separately collected, as hereinbefore described.

Fifthly—The means of rendering platinum and other unalterable and inoxidizible metals illuminating, by the combustion of hydrogen, or even of oxygen, as hereinbefore described.

Sixthly—The means of rendering platinum and other unalterable and inoxidizible metals more or less illuminating by means of hydrogen, or of hydrogen and oxygen, or also of hydrogen and air united before, or at the place of combustion, as before described.

Seventhly—The process of illuminating, by heating platinum and other more oxidizible metals to luminous white heat, by means of hydrogen, burnt either alone, or combined with oxygen, as before described.

[This specification contains descriptions of processes which are not claimed, and claims of processes which are not described.

Meanness Carried to Extremes.

The "Farmer and Mechanic," a celebrated journal of "masterly" stupidity, not satisfied with copying the official report of the Patent Claims from our columns, week after week, under the grave and *honest* announcement of its being a "feature not to be found in any other publication in this country,"—has got into the habit of copying original articles which have appeared in our columns, and crediting them to other journals. In proof of which we call attention to the "Novel and Ingenious Clock" of John Geldard, on the second page of the last number of that paper, the "humorous description," it seems, the editors found in the "American Cabinet,"—a journal probably of the same stamp, and through whose kindness they were furnished with the description of Chas. S. Snead's Grain Dryer, taken from No. 33, Vol. 5, "Sci. Am." The "Farmer" could have had the description of Mr. Geldard's clock—without credit, two weeks earlier, by reference to the "Sci. Am." of June 8th. We would add that the description was furnished for this paper, and was modified in some points by us. It would seem singular that the "Cabinet" should have hit upon our modification, word for word, as the "Farmer" does in copying our Patent Claims the week after they have appeared in our columns.

If this had been the only instance of their *unbounded generosity*, we should have paid no attention to it. We now call attention to another misappropriation of our labors, in order, if possible, to open the eyes of the editors to the fact, that like "Sol Gills," the old chronometer maker, they "are a long way behind the time." In their paper of April 25th, an article "To Prevent Dampness in Walls," is credited to a southern journal, which was original with us, and appeared in the "Sci. Am.," April 6th. We sincerely hope that the editors of the "Farmer" will, for the future, abandon a business so small as this. If they are short of brains to fill up the paper, we will not say one word against their extracting largely from our columns, "without giving proper credit for the same," by so doing they will be nearer the age, a benefit not only to themselves, but a corresponding one to some of their readers, who no doubt have full belief that they are first and foremost in the receipt of all that relates to the progressive age.

Great Building.--Exhibition of the Industry of all Nations.

A monster building is now being erected for this exhibition; it will be about 2,300 feet long and 400 feet across. The dome of it is to be 200 feet in diameter, made of light sheet iron. This will be an immense project. The whole building is to encircle an area of twenty acres.

Glasgow.

We are indebted to the News Agent of the City of Glasgow Steam Propeller for the prompt delivery of our files of the "Glasgow Daily Mail." The City of Glasgow made a fine run of about 14 days, which is equal to 13 from Liverpool. For a propeller this is a remarkable passage. Capt. Matthews had a splendid piece of plate presented to him by the passengers.

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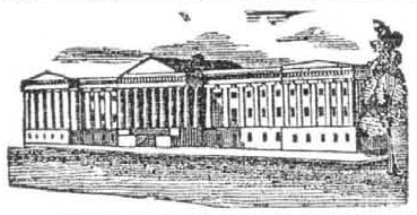

☞ Our weekly List of Patents and Designs contains every new Patent, Re-issue and Design emanating from the Department, and is prepared officially, expressly for the Scientific American, and for no other paper in the city, consequently other journals are obliged to wait the issue of the "Sci. Am." in order to profit by the expense to which we are subject, and of course must be one week behind. Those publishers who copy from this department in our columns, will, in justice to us, give proper credit for the same.

LIST OF PATENT CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending June 25, 1850.

To S. Andrews, of Perth Amboy, N. J., for model for vessels.

I claim the forming a vessel with a scow shaped bow, having on its sides two wide keels running the whole or a part of its entire length and so constructed that a portion of the inclined surface of the bottom shall always be above the water at the bow, and this with or without the supplementary keels forming small channels, by which construction air enters at the bow in the manner set forth, and is retained under the bottom of the vessel for certain purposes described herein.

To A. M. Billings & T. A. Ambrose, of Claremont, N. H., for improvements in connecting and disconnecting hubs and axles.

We claim the method herein described, of securely fastening the hub of a wheel to its axle, or easily detaching the same therefrom, to wit, by means of the two sliding plates combined with the double scroll-shaped cam, in such a manner that by turning the said cam in one direction, the sliding plates will fasten the axle journal within the hub so securely that it cannot be unfastened by any jar or shock upon the wheel; and by turning the said cam in an opposite direction, the sliding plates will be detached from their hold upon the axle journal and permit the wheel to be detached therefrom.

To John A. Cleveland, of Charleston, S. C., for improvements in setting artificial teeth by atmospheric pressure.

I claim the air chamber, constructed and arranged substantially as herein above set forth and for the purposes described.

To M. C. Bryant, of Lowell, Mass., for improvements in looms for weaving cut pile fabrics.

I am aware that short intersecting plates have been used, but in those cases they were applied to hand looms, and did not extend through the reed, nor were they supported at their ends or protected, so that the warp threads could not catch upon them. I am also aware that an intersecting knife has been used, placed in the intersecting plates, therefore I do not claim these as being new, or of my invention,—but I claim, first, the use, in power looms for weaving cut pile fabrics, of intersecting plates, entering between the two pieces of cloth, and allowing the pile warps to cross and re-cross from one to the other. which extend through the reed, thereby forming on their upper surface a plane upon which one of the shuttles is supported in passing through the web, substantially as described.

Second, the continuing of the intersecting plates to the outside of the warps, by adding the within described false reed, or otherwise, for the purpose of supporting the ends of the intersecting plates and for guiding the warps by them, substantially as described.

To T. Culbertson & G. Scott, of Philadelphia, Pa., for improvement in Brick Presses.

We claim the method of preventing clay from adhering to the surfaces which make pressure on it or in which it is pressed or moulded by the application of artificial heat to such surfaces, substances as herein described.

And we also claim the method of elevating the followers of the mould for discharging the bricks by combining with the carriage of moulds a platform or carriage which slides on inclined ways, and which receives motion from a carriage of moulds, substantially in the manner and for the purpose specified.

To P. F. Ellicott, of Philadelphia, Pa., for improvements in Atmospheric Churns.

I claim a hollow staff, connected with a square or round hollow plunger, with a valve placed at the top, or at any point inside of said staff, said valve to be so arranged that when the said staff and plunger are raised, the valve will open; and when said staff and plunger are forced down the valve will close, and the atmospheric air in the plunger will be forced through the body of the milk or cream, by which operation butter will be formed, said staff dasher and valve to be used in any vessel containing milk or cream.

To G. H. Horn, of Boston, Mass., for improvement in Electric Telegraphs.

I claim the above described or improved Electro-caustic Telegraph, or application to telegraphic purposes, and substantially as specified, of heat generated by electric apparatus, or a current or currents of electricity passed through a fine platinum wire, or other proper conductors or equivalents therefor, as explained; the marks produced in or through the paper, or other material used in connection with the heated wire, being regulated in their length and number, so as to be characters or expressions of letters, figures or words, indicative of any message which it may be desirable to transmit, from the battery and of the telegraph, to the other end of the line, all essentially as set forth, or in the manner generally understood by telegraphic operation.

[The Patent Office has become mighty generous in granting telegraph patents lately. What's in the wind?

To J. G. Howard, of North Easton, Mass., for machine for forming washers and attaching them to carpet tacks.

I claim the spring nippers arranged on a vibratory arm, and having a tapering bore, formed one half in each of said nippers, for guiding the point of the tack to the centre of the washer. Also the combination of said nippers with the circular die, and vertical moving punch, arranged and operating, as above set forth.

I also claim a machine for preparing carpet tacks, consisting of the parts above stated, in connection with an adjustable feeding motion, composed of the double endless bands, ratchet and pawl, and parts which connect the same with the driving lever, as herein above set forth.

To A. L. Johnson, of Baltimore, Md., for improvement in the hinge of rolling iron shutters.

I claim constructing the hinges or joints of rolling iron shutters of thin slats of iron by having a bar or wire inserted within the coiled edges of the joint or hinge, to give strength and stiffness to the joint, said bar having its ends bent to prevent the several strips of iron composing the shutter, from sliding laterally on each other, and the projecting bent ends of the wire being covered by ears projecting from the ends of the strips and turned down, thus forming an even edge to the shutter, which will slide easily in the groove of the frame in which it is placed, the whole being constructed substantially as described.

To J. A. Whipple & W. B. Jones, of Boston, Mass., for improvement in producing photographic pictures upon transparent media.

We claim, first, the taking of Photographic pictures upon transparent media, by coating them with some suitable vehicle for the sensitive materials, substantially as set forth.

Second, we claim the process of preparing and using the sensitive coating or film upon surfaces, whether of transparent, translucent, or opaque bodies, substantially in the manner and for the purposes set forth.

[See Humphrey's Photograph, page 91.—Ed.

To A. Keagy, of Middle Woodburgh, Pa., for improvement in Cooking Stoves.

I claim the combination of flues with a single damper, so that by a single movement I cause the hot air to traverse once or twice entirely around the oven at pleasure, substantially as described.

To N. Myers, of Charlestown, Va., and F. C. Smith, of Harper's Ferry, Va., for improved arrangement of sash stopper.

We wish it to be understood that we do not claim the eccentric separately considered, nor its employment in connection with the window sash as a fastener, and to suspend the same, nor the strips when used as weather strips to make tight joints; nor do we claim the strips separately considered, but what we claim is placing the eccentric within the bar or stile of the window sash, in such a manner as to act upon a weather strip—instead of against the frame or casing of the window—the former being thereby firmly pressed against the latter, and all defacement of the window frame by the eccentric avoided, as described.

To J. R. Nelson, of Knoxville, Tenn., for improvement in mounting the knife of straw cutters.

I claim the placing of the pivot of the knife upon a spring, for the purpose of enabling the operator to give the knife a draw or sliding cut. The other parts are not claimed.

To N. Potter, of East Hamburg, N. Y., for machine for repairing roads.

I claim hanging the cutters for cutting off the ridges at the sides of the ruts, the scrapers for scraping the dirt into the ruts, and a roller for pressing and smoothing the road upon the same frame, all the said parts operating together in the manner and for the purposes set forth.

To C. Rodgers, of Montpelier, Vt., for improvement in the weed cutters of a cultivator.

I claim the combination of the bar with the weed cutter, in the manner and for the purpose set forth.

To T. R. Timby, of Cato-Four-Corners, N. Y., for improvement in water wheels, for increasing or diminishing their diameters.

I do not claim moving floats, as they have before been used on paddle wheels to move out and in on their arms, but I claim the double adjustable arm, constructed as above described, for expanding or contracting the size of the wheel, for the above specific purpose, so that the absolute diameter of the wheel and arms shall be reduced or expanded, to go within a suitable curve.

To John Underwood, of Montpelier, Vt., for improvement in self-acting cheese presses.

I claim the arrangement of four rollers and two wedges, in combination with the inclined planes (two) acting in the manner and for the purpose herein set forth in the foregoing specification, to produce a sufficient pressure upon the cheese or other article to be pressed.

To W. Upfield, of Lancaster, Ohio, for improvements in Boot Trees.

I claim the combination of the two sliding wedges and the right and left screws (two,) with the inclined planes or grooves (two), substantially in the manner and for the purpose above set forth, the screws being made to play within the groove, and being confined to its place longitudinally by the bar working in the groove.

To M. S. Watkins, of Somerville, Tenn., for improvements in Carriages.

I claim the combination of the open elliptical axle-tree with the sliding slotted frame attached to the body of the vehicle, and passing through the upper half of the axletree—and attached to the upper leaf of the elliptical spring placed inside of the axle-tree—the lower leaf of said spring being secured to the inner side of the lower half of the axletree, the several parts being arranged and operating in the manner and for the purpose herein fully set forth.

To H. Yaw, of Boston, N. Y., & T. P. How, of Buffalo, N. Y., for improvement in waste gates.

We claim a waste gate which is hung upon a vertical axis the lower part of which is made wider one side of the axis than it is the other, the side which is narrowest towards the bottom of the gate being sufficiently wider than the other towards the top, that the balance of the pressure of the water will change from one side of the axis to the other, and open and close the gate as the water rises and falls.

DESIGNS.

To J. E. Owens, J. Ebert, & E. G. Dyer, of Hamilton, Ohio, for design for stoves.

To W. Race, of Seneca Falls, N. Y., for design for stoves.

To W. L. Sanderson, of Troy, N. Y., for design for cooking stoves.

A company of New York and Maine men have purchased three hundred thousand acres of wild land in West Virginia, on the Guyandott river, and have sent on a company of workmen to erect six dams, with locks and piers upon the river to render it boatable.

Why Epidemics Rage at Night.

It was in one night that 4,000 perished by the plague of London of 1665. It was at night that the army of Sennacherib was destroyed. Both in England and on the continent a large proportion of the cholera cases, in its several forms, have been observed to have occurred between one and two o'clock in the morning. The "danger of exposure to night air," has been a theme of physicians from time immemorial; but it is remarkable they have never yet called in the aid of chemistry to account for the fact.

It is at night that the stratum of air nearest the ground must always be the most charged with the particles of animalized matter given out from the skin, and deleterious gases, such as carbonic acid gas, the product of respiration, and sulphuretted hydrogen, the product of the sewers. In the day, gases and vaporous substances of all kinds rise in the air by the rarefaction of heat; at night, when this rarefaction leaves them, they fall by an increase of gravity, if imperfectly mixed with the atmosphere, while the gases evolved during the night, instead of ascending, remain at nearly the same level. It is known that carbonic acid gas at a low temperature partakes so nearly of the nature of a fluid, that it may be poured out of one vessel into another; it rises at the temperature at which it is exhaled from the lungs, but its tendency is toward the floor, or the bed of the sleeper, in cold and unventilated rooms.

At Hamburg, the alarm of cholera at night in some parts of the city was so great, that on some occasions many refused to go to bed, lest they should be attacked unawaresin their sleep. Sitting up, they probably kept their stoves or open fires burning for the sake of warmth, and that warmth giving the expansion to any deleterious gases present, which would best promote their dilution in the atmosphere, the means of safety were thus unconsciously assured. At Sierra Leone, the natives have a practice in the sickly season of keeping fires constantly burning in their huts at night, assigning that the fires kept away the evil spirits, to which, in their ignorance, they attribute fever and ague. Latterly, Europeans have begun to adopt the same practice; and those who have tried it, assert that they have now entire immunity from the tropical fevers to which they were formely subject.

In the epidemics of the middle ages, fires used to be lighted in the streets for the purification of the air; and in the plague of London, of 1665, fires in the streets were at one time kept burning incessantly, till extinguished by a violent storm or rain. Latterly, trains of gunpowder have been fired, and cannon discharged for the same object; but it is obvious that these measures, although sound in principle, must necessarily, out of doors, be on too small a scale, as measured against an ocean of atmospheric air, to produce any sensible effect. Within doors, however, the case is different.—It is quite possible to heat a room sufficiently to produce a rarefaction and consequent dilution of any malignant gases it may contain; and it is of course the air of the room, and that alone at night, which comes into immediate contact with the lungs of a person sleeping.

[The above is from the Westminster Review, and is no doubt perfectly correct. It is also well known that the heat of the body is about two degrees lower at night during sleep, than through the day. This may also account for much sickness, by people not being careful to keep on enough of clothing at night, in hot weather, to maintain the proper degree of heat necessary. In warm southern climates, a fine net enveloping the bed like a curtain, while it serves for a musquito bar, also answers the purpose of a health preserver, upon the principle of Sir Humphrey Davy's safety-lamp.—The question may justly be asked here, "is carbonic acid gas naturally a cause of fevers, cholera, &c.?" This no one can answer with a *yes*, for no analysis of the atmosphere, in places infected with disease, has yet been able to detect anything peculiar in it. Yet for all this experience and reason should not be lightly esteemed, and such we hold to be the substance of the article we have quoted.

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TO CORRESPONDENTS.

"P. F. G., of Mass."—There are several connecting shackles now in use.

"A. B. L., of Conn."—We think your ideas of the lever wrench are good; you had better send us a small model for further examination.

"W. F., of N. J."—There is no doubt but that you will be able to secure a patent on your box. We know of nothing for the purpose. You had better forward one to this office.

"E. P. B., of Ohio."—We have sent you a copy of the Patent Laws, and given you credit for the balance, 75 cents, on subscription account.

"X., of Mass.—We should think your plan to be both new and patentable, so far as there is any possibility of judging from a mere description, which, when it relates to a machine, is not satisfactory to us. We cannot tell whether it would pay or not. If a friend of yours, bound for California, should ask you whether he would make money by the operation, you would naturally reply that much would depend upon luck and management, a point easily decided after the trial. We are often asked whether an invention will pay or not, but as yet we have never been able to invent a way by which it could be answered correctly.

"A. P., of Ohio."—We have called upon Messrs. Wells & Co., in reference to the package. They will examine into it.

"G. W., of Pa."—We should charge you $3 for the engraving you refer to in Vol. 4; a new one of that size would cost $10. The numbers you missed we have sent.

"M. M. F., of Pa."—There is no danger of any advantage being taken of your invention, if you are careful of it. The model in our possession is safe.

"I. N. B., of Va."—We have shown your letter to some different parties interested in steam engineering, and find that applications are constantly being made for such situations. We know of no vacancy at present.

"G. B. M. of Texas,"—The result of your application will be made known to you in about two weeks—it is before the examiners at the Patent Offics at the present time.

"J. P. H., of Va."—Iron pipes will not withstand the action of salt water, and although they may be zinced it soon wears off.—Lead pipes will stand the action of the salt, but the gutta percha tubes will do so much better. See the advertisment of H. H. Day, in another column. Walworth, Nason & Guild, 79 John st., can give you the price of the tubes, by stating to them explicitly what you want. We cannot answer you about the boiler. You can correspond with Mr. Day, about the guttar percha.

"J. N. G., of N. Y."—We forwarded you a copy of Minifie's Mechanical Drawing Book by mail on the 1st inst.

"L. E. C., of N. Y."—We believe that your improvement is patentable, but you will first have to make a model before you can apply for a patent, unless you want to file a caveat, and then a more minute description should be sent us.

"J. C. S., of Ohio."—Your name is on our mail book, and the back numbers are marked as having been sent, if you miss any numbers we are willing to furnish them.

"W. W., of Ct."—Yours of the 29th reached us in due time. We have corresponded with the parties in Phila., in reference to your proposition, and shall expect to hear from them soon,—of the result you will be advised.

"N. J. W., of Mass."—Your method of attaching heavy stones for hoisting appears to be good, and we can see no reason why a patent should not be granted for it. It is certainly new to us.

"J. A. A., of N. Y."—By reference to No. 10, Vol. 5 Sci. Am. you will find an engraving of Wilson's machine which embraces all the points in your invention, with the exception of the one designated by you, which appears to be a good improvement. You could not however use the other features, as Mr. W. claims those in his specification.

"W. A. B., of Phila."—The same principle as you describe is used on all the Cunard steamers and we presume on others. It is well known.

"H. B. S., of Vt."—There have been a number of such mills used for years. They are common as old fashioned coffee mills, and can refer you if you were here to those who have used them.

"J. T., of Phila."—We fully understand your invention and believe it to be patentable. If you apply for a patent, you must make a complete, although it may be a small model.

"S. H., of Mass."—There is no patent for extinguishing fire by carbonic acid gas, nor one cannot be obtained for it. There was a patent for a kind of machine which used it, but not the gas.

"L. W. H., of N. Y."—The power will not operate as you propose by the air pump. This same thing was tried on an extensive scale and failed.

"L. H., of Pa."—Your seed planter appears to be good, but we do not see where a claim could be instituted upon it except in the manner of operating the shank to stop the spout. That is good and patentable.

"G G. L., of N. Y.—Your churn is good and beautiful but we are at a loss to see what part could be claimed. The dasher as you say, appears to be worthy of a patent.

"W. B. B., of Me."—Your papers have been filed at the Patent Office.

A number of correspondence is left till next week, our letters having been very numerous this week.

Money received on account of Patent Office business, since June 26th, 1850:—

A. S. M., of Vt., $45; C. F. B., of R. I., $10; A. C., of N. Y., $30; W. M., of Ohio, $55; C. R., of Wis., $20; A. C. of Mass,, $15.

An Improved Straw Cutter.

We have for sale a most excellent Straw Cutter, constructed upon an entirely new and improved principle. It was left at this office by the inventor, who wished us to dispose of it for him. It is easily kept in order and executes very rapidly. Price $12, carefully boxed. Address Munn & Co.

New Agents for the Scientific American.

Our South Carolina friends are hereby informed that we have completed an arrangement with the publishers of the "Southern Literary Gazette," to receive subscriptions for the Scientific American. Money paid to the Editor, Mr. Richards, at Charleston, for subscriptions will be duly acknowledged and the paper forwarded as he may direct.

Back Volumes Scientific American.

We are obliged to inform our patrons that complete sets of all the past Volumes are entirely exhausted. We have a few incomplete sets of Vols. 2 and 3, comprising about 50 Nos. of both Vols., which may be had by remitting one dollar, and we have sets of above 40 Nos. each of Vols. 3 and 4 which will be forwarded by mail an the receipt of one dollar for each set. Those desiring to secure Vol. 5 but have delayed subscribing at first, are advised to remit $2 without delay or they may be disappointed in getting a volume at all, should they wait until the Nos. are all published?

Important Notice to us!

Whenever any of our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

STEAM ENGINES AND BOILERS.—The undersigned has for sale one engine of 12 horse power, 1 of 6 and 1 of 5 horse power, new and of good quality; also one second-hand engine and boiler, 14 horse power, for $950, in good repair; 1 of 6 horse power, in good working order, with boiler, for $300. Steam Boilers made to order at the lowest cash prices and of the best materials; also planers, fan blowers, heaters, pumps, shafting pullies, &c., at No. 4 Harvard st., New Haven, Ct. AARON KILBORN. 426*

JUST ISSUED—A new edition of Minifie's Mechanical Drawing Book, substantially bound in paper, which can be forwarded through the mail.—Price $3. For sale by MUNN & CO., Agents, New York. 42tf.

COTTON MACHINERY FOR SALE.—All the machinery belonging to a cotton factory now in operation, consisting of pickers, cards, mules, drawing frames, looms, &c. &c., all in good running order, and for sale cheap. Apply to ANDREWS & JESUP, No. 70 Pine st., N. Y. 41 3

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WOOD'S PATENT SHINGLE MACHINES—These excellent machines, illustrated and described in No. 23, Vol. 5, Scientific American, are offered for sale in Town, County and State Rights, or by single machines. There are three sizes, the first cuts an 18 inch shingle, price, $100; 2nd cuts 24 inch, price $110; 3rd, 28 inch, $120. Orders addressed to J. D. Johnson, Easton, Conn., or to Munn & Co., "Sci. Am." Office, will meet prompt attention. 36 tf

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Scientific Museum.

Lightning and Lightning Conductors.

(Prepared for the Scientific American.)

No. 1.

Sheet lightning is the vivid discharge of electricity amongst the clouds reflected from their surfaces; this gave the appearance of one blaze of flame, the spark or jet from its momentary existence itself is rarely seen, in consequence of the strong light produced by its reflection, and its being occasionally hid by the dark, dense, intermediate mass of clouds. The appearance termed fire-balls or globular lightning is similarly explained but possibly from a denser state of the atmosphere and the resistance offered to its passage collects and condenses the charge at its point, as it were, forming a knob. Appearances of zig-zag and forked lightning are produced; the first, by the passage of an ordinary discharge from the clouds to the earth, the air being gradually condensed before it, offers so great a resistance to its passage in a direct line at one point that it is turned aside, if it may be so expressed, tending however constantly downwards, it gets out of the sphere of condensation, finds an easy passage onwards to the earth for a time; the same effect again takes place, and so on till it reaches the surface of the earth or some projection from it. If in its passage down it meets with currents of air inferior in conducting power to the medium in which it is travelling, or if in its approach to the earth it finds two or more points on which it can discharge itself within limited distances of each other, it divides, and the appearance is denominated forked lightning. It would be a labour of time to recite the records of so vast a number of cases of the serious effects of disrupted discharges of electricity upon unprotected buildings &c., as are collected.

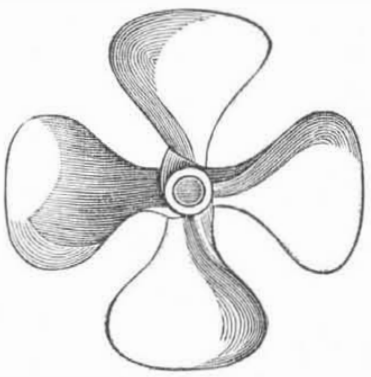
For the suggestion of the application of metal conductors to buildings, &c., we are undoubtedly indebted to the celebrated Dr. Franklin, for his own words where he proposed "for protecting houses, churches, ships, &c., from the stroke of lightning, to fix on the highest part of these edifices upright rods of iron, made sharp as a needle, and gilt to prevent rusting; and from the foot of these rods, a wire down the outside of the building into the ground, or down round one of the shrouds of a ship, and down her side till it reaches the water. Would not these pointed rods probably draw the electrical fire silently out of a cloud before it came near enough to strike, and thereby secure us from that most sudden and terrible mischief?" He however subsequently recommended iron rods of about one-half to three-quarters of an inch diameter, which were to be fastened to the wall, chimney, &c., with staples of iron. He adds "The lightning will not leave the rod, a good conductor, to pass into the wall, a bad conductor, through the staples. It would rather if any were in the wall, pass out of it into the rod, to get more readily by that conductor into the earth. If the building be very large and extensive, two or more rods may be placed at different parts, for greater security. Small ragged parts of clouds suspended in the air between the great body of clouds and the earth, often serve as partial conductors for the lightning, which proceeds from one of them to another, and by their help comes within the striking distance of the earth or a building, it therefore strikes through those conductors; a building that would otherwise be out of the striking distance. Long sharp points communicating with the earth, and presented to such parts of clouds, drawing silently from them the fluid they are charged with, they are then attached to the cloud, and may leave the distance so great as to be beyond the reach of striking.—It is therefore that we elevate the upper end of the rod six or eight feet above the highest part of the building tapering it gradually to a fine sharp point which is gilt to prevent its rusting, thus the pointed rod either prevents a stroke from a cloud, or if a stroke be made conducts it to to the earth with safety to the building. The lower end of the rod should enter the earth so deep, as to come at the moist part, perhaps two or three feet; and if bent under the surface so as to go in a horizontal line, six or eight feet from the wall, and then bent again downward three or four feet, it will prevent damage to any of the stones of the foundation."

History of Propellers and Steam Navigation.

[Continued from page 328.]

Fig. 65.

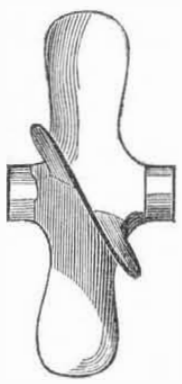
FOUR BLADED FRENCH PROPELLER.



This is a propeller which was employed on a French Mail Boat, named the Napoleon, in 1842. Fig. 65 exhibits a front, and fig. 66 a side view. This propeller was fixed in a space or opening abaft the usual stern-pot, (to which, in an ordinary vessel, the rudder would be hung) and within side another stern-post which was erected on a prolongation of the keel, farther aft, for sustaining the rudder, so as to leave a space between the two posts, for the reception of the propeller. The centre of the propeller was 6 feet beneath the surface of the water; its diameter was 7 feet 6 inches, and the highest point of its pheriphery was 2 feet 3 inches below the water line, when the mean draught of water aft was about 11·82 feet.

Four propellers of the same diameter, but of different forms, were made, in cast-iron, and were tried with various success. The propellers had been altered several times; and it was found that within certain limits, by cutting away the ends so as to shorten the length of the screw, which had also the effect of diminishing the surface of the blades, the speed of the vessel was increased, and the vibration was reduced; a portion of this effect had, however, been attributed to using four arms. A propeller with three blades, occupying the whole of the circle, was first tried; others which presented less central surface answered better; and the best, which was still in use, had four blades, which occupied six-tenths of the area of the circle, when viewed in the direction of the axis, leaving four-tenths of that area vacant for the free escape of the water between the blades, whose obliquity was such as to produce an advance of 10 feet 3 inches in a revolution.

Fig. 66.

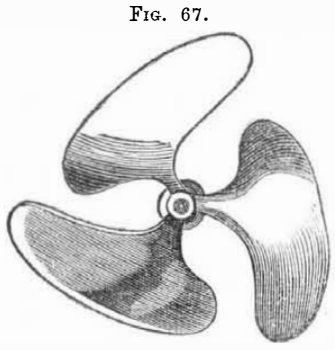


The motion was communicated to the propeller by a spur wheel of 126 teeth, working into a pinion of 20 teeth, which gave nearly 6⅓ revolutions for each stroke of the engine, or about 120 revolutions of the propeller per minute. The ordinary speed of the vessel, without any sails being used, was 10 knots or 11½ statute miles per hour.

CONOIDAL SCREW PROPELLER.

This is a screw of three blades, invented by Messrs. Rennie, of London, and applied by them, in 1839, to a steamer named the Dwarf Friction wheels were first used for giving motion to the propeller, but on account of their noise and slipping, they were abandoned, and spur wheels, with wooden teeth substituted. It made about 150 revolutions per minute. The advantage of this form of screw over the one represented last week, is an increasing pitch, so formed that while the propeller is rotating on its axis, the vessel is advancing—thus making far less slip. These blades are curved conoids, therefore they have variable curves approximating to angles from 27° to 30°. It was 5 feet 10 inches diameter, and had an area of about 15 square feet, and in smooth water propelled the vessel at the rate of 12 miles per hour,—the vessel being 164 tons burden, with engines of 70 horse power. In 1843 this vessel ran 200 miles in 23 hours, and used 10 tons of coal in 27 hours, from the time of getting up the steam. This propeller had a slip of one-eighth. The superiority of the conoid propeller was set forth to be the best, as being formed after nature's laws and the swiftest of fishes. The opening towards the centre of motion by reducing the arms of the screw blades, as far as strength would allow, (as the rotative motion towards the centre is less than the circumference,) therefore reduced a tendency to centrifugal action on the water. The gradual alteration of the angle of the blade to the axis of the screw or outward path of the vessel, affords a greater onward action of the blade at the entrance, whilst it gradually curves round to nearly a right angle with the path, so as to leave the water without causing a revulsion. The salmon, when it makes a run, puts down all its side fins, and solely by the oblique action of the tail, is propelled forward with great force

Fig. 67.



and speed, the flexible nature and curving form of the tail, so as to leave the water without revulsion, contributes to this object.

Curious Facts in Natural History.

It is but a little more than twenty years since the first crow crossed the Genesee River westwardly. They, with the fox, the hen-hawk, swallow, and many other birds and insects, seem to follow civilization.

The locust borer is not of more than thirty years introduction into the United States, and has not yet reached the native groves of the locust-tree at the south and west. It commenced its ravages on the east side of the Genesee River in 1830, and it was seven years before it crossed to the west side.

The grain worm, or weevil, began its course of destruction in Vermont, about the year 1828, and it progresses in the course it takes from ten to fifteen miles a year. It has not yet reached Western New York to any extent; but the destroyer is on its march, and desolation will follow its track in this great wheat-growing region.

Rose-bugs have been so common in some of the Eastern States, that on the sea-shore they have floated in winrows on the sands, having been driven into the sea by winds, and drowned. They have only made their appearance in this region, in any quantities, within two or three years.

The cedar or cherry bird was first noticed west of the Genesee River in 1828, and now it is so great a pest as to induce many to give up the cultivation of cherries, especially if near woodland.

The plum-weevil, or curculio, which is indigenous to America, being unknown in Europe, was first discovered by Mr. Goodsell, the first editor of the Genesee Farmer, since which time it has disseminated itself over the whole continent.

The gopher, a spices of ground squirrel, with pouches on the outside of its cheeks to carry the dirt from its hole, is very plenty on the west side of Mississippi, in Missouri and Iowa, but has never yet crossed the river into Illinois or Wisconsin. It only works in the night, burrowing in holes and run-ways under ground—subsisting on the roots of trees, grasses, and vegetables. There are persons who have suffered by their depredations for twenty years, who have never been able to catch, or even see one, of these nocturnal depredators.

The cut-worm is of recent origin. The first it was noticed as doing much damage, was during 1816 and 1817, noted as the cold years, when the whole northern country approached the very brink of famine. They are now universal.

The Hessian fly was introduced, it is supposed, by the foreign mercenaries in 1777, on Long Island, from their baggage, or in the forage for their horses.

If salt hay is placed around goosberry bushes, it is said to be a preventative of mildew. The bushes should be kept in a cool moist place. Hay with salt sprinkled on it will absorb the moisture.

The steamer Pacific arrived in this city from Liverpool at 9 A. M., on Monday last. Time 11½ days.

LITERARY NOTICES.

Gallery of Illustrious Americans.—We have received from Messrs. Brady & D'Avignon the sixth number of this great American work. It contains a splendid likeness of Col. Fremont, together with a well written biography of his eventful life. The engravings and letter press are among the most beautiful specimens of the art we have ever seen. When complete it will be a publication of extraordinary merit, a proud ornament to American history and a lasting fame to its projectors. The work is to be completed in 24 numbers, at $1 each. Edited by C. Edward's Lester.

American Cottage and Villa Architecture,—a series of views and plans of residences actually built: intended as models for those about to build, as well as Architects, Builders, etc., with hints on Landscape, Gardening, Laying out of Grounds and Planting Trees. By J. C. Sidney, Architect and Engineer.—Appleton & Co. publishers: price 75 cts. per number. The design of this new work is fully stated in the caption above, and the first number now before us is very beautiful both in text and illustrations, not surpassed by any similar work upon the subject. It is to be issued monthly, and will be complete in 10 parts.

Holden's Dollar Magazine, July Number.—Four spirited engravings and several excellent contributions; "The Literary Cocked Hat and Transcendental Tea Pot," is a most amusing conglomeration of subjects—something after the style of "The Buncomb Flag Staff." The number is good.

Iconographic Encyclopedia.—Part 9 of this splendid work is just issued by Mr. Garrigue, No. 2 Barclay st., this city. This part treats of Botany in its various branches. It contains plates from 23 to 42, being maps of the principal cities of Europe. As each part is only one dollar, a single map costs only five cents, and the letter press into the bargain,—how cheap!

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